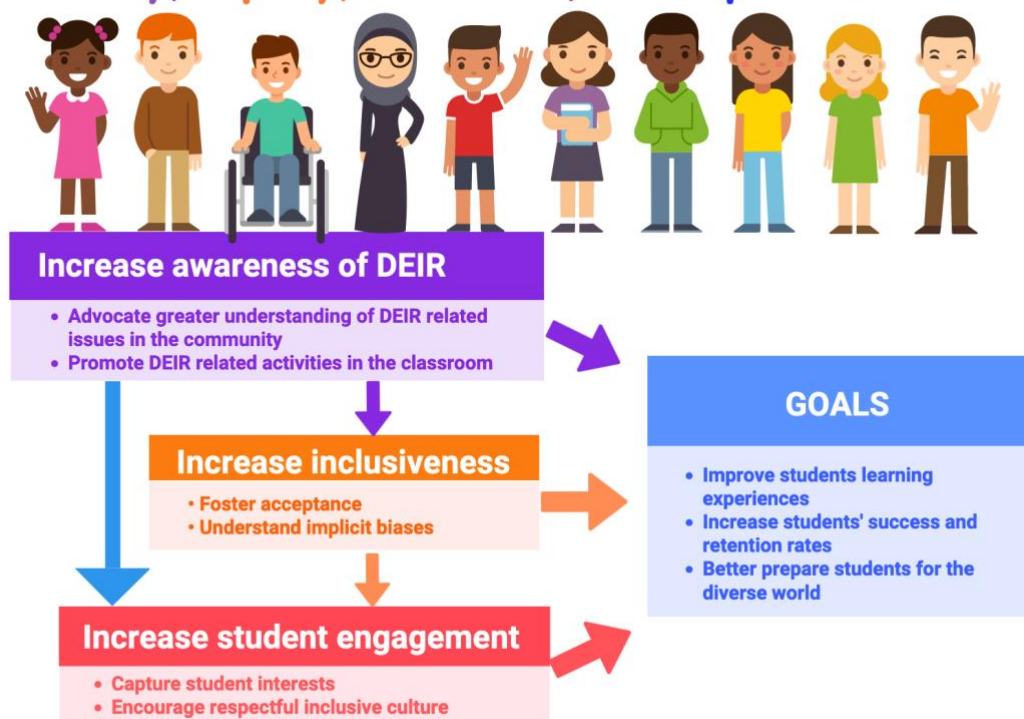


## Project Title: Diversity and Inclusion Value Equity (D.I.V.E.)

The D.I.V.E. project provides curricular guidance for students to *value* diversity, equity, and inclusion within their CSU STEM classrooms and broader community.

### Diversity, Equity, Inclusion, & Respect activities



#### Contact Information:

Project Director: Akiko Nakamura, Assistant Professor of Chemistry (primary contact)  
Email : [nakamura@colostate.edu](mailto:nakamura@colostate.edu)

Collaborator: Arlene F. Nededog, Director of Inclusion, College of Natural Sciences  
Email : [arlene.nededog@colostate.edu](mailto:arlene.nededog@colostate.edu)

#### College/Unit:

College of Natural Sciences

#### Financial Officer Contact Information:

Financial Officer: Karen Kahler, Manager of Financial Operations  
Email: [Karen.Kahler@colostate.edu](mailto:Karen.Kahler@colostate.edu)

**Abstract:**

As part of the CSU community, we are committed to inclusion, integrity, respect, service, social justice, and engagement. This Diversity and Inclusion Value Equity (D.I.V.E.) project will create an inclusive science, technology, engineering, and math (STEM) pedagogy program by incorporating diversity, equity, and inclusion (DEI) activities into the classroom in the College of Natural Sciences. As various courses in the College are service courses for STEM majors, many students would be exposed to DEI activities with this D.I.V.E. program. Traditionally, natural science courses do not cover any DEI components and activities. However, to create an inclusive community, we should offer interdisciplinary programs including DEI activities into STEM education, so that future scientists, engineers, and health science professions would amplify their exposure to DEI issues, such as implicit bias, microaggressions, and stereotypes. The purpose of the D.I.V.E. project is to encourage the participation of CSU STEM students in an engaged and respectful community by valuing diversity, equity, and inclusion. This collaborative project will be organized by Ms. Nededog, Director of Inclusion in the College of Natural Sciences, and Akiko Nakamura, Assistant Professor of Chemistry. We will run a pilot program with the mini-grant in Spring 2023, analyze the results, and develop the insights to establish the inclusive STEM pedagogy program to move forward for the next academic year.

**Project Description:**

It has been predicted that the U.S. population will continue to be more diverse, and the “majority–minority” crossover will happen around 2044, according to the U.S. Census Bureau. The demographic profile of the student body continually changes with time; international collaboration on research and other professional pursuits have simultaneously increased with globalization. As this demographic trend continues to develop and translate into a more diverse society, awareness of diversity and cultural heterogeneity in the classroom has become more important than ever. Table 1 displays the demographic profile of the CSU student body for fiscal year 2022, indicating this is indeed a diverse population.

Table 1. Fiscal Year 22 Common Data Set at Colorado State University

	Degree-Seeking First-Time First Year	Degree-Seeking Undergraduates (include first-time first-year)	Total Undergraduates (both degree- and non-degree- seeking)
Nonresident aliens	57	632	655
Hispanic/Latino	803	3,815	3,899
Black or African American, non-Hispanic	127	561	584
White, non-Hispanic	3,623	17,528	17,851
American Indian or Alaska Native, non-Hispanic	25	135	140
Asian, non-Hispanic	155	715	744
Native Hawaiian or other Pacific Islander, non-Hispanic	9	34	34
Two or more races, non-Hispanic	273	1,241	1,261
Race and/or ethnicity unknown	35	154	194
<b>TOTAL</b>	<b>5,107</b>	<b>24,815</b>	<b>25,362</b>

Source: [http://irpe-reports.colostate.edu/pdf/cds/CDS\\_2021-2022\\_optimized.pdf](http://irpe-reports.colostate.edu/pdf/cds/CDS_2021-2022_optimized.pdf)

As the demand for professions in the field of the STEM continues to increase, more students are seeking to establish STEM careers. Thus, the need for and interest in emphasizing diversity, equity, and inclusion in STEM education have increased significantly. The College of Natural Sciences’ strategic plan for 2022-2027 supports the following values:

- We encourage collaboration and multidisciplinary work.
- We foster a diverse and inclusive environment where everyone can thrive.
- We value local, national, and global engagement.

This D.I.V.E. project alignments with those values listed above as with the Inclusive Excellence areas of focus indicated below:

- Partner with other CSU units to ensure students are more culturally competent and have skills to enter into a diverse global workplace;
- Improve the university climate of inclusion; and
- Enhance effectiveness of curriculum, educational programs, and research, with regard to diversity and inclusion.

Integrating DEI activities into STEM courses can encourage a positive outlook by fostering a diverse and inclusive environment, subsequently further encouraging collaboration and engagement. Thus, the aim of the D.I.V.E. project is to **take the students diving into DEI in STEM education**. To amplify student exposure to cultural, social, and economic impact on the lives of people, this project will incorporate DEI into the curriculum in the Natural Sciences. The activities seeking to accomplish this objective include the following options: (1) attending a DEI talk or event and submitting a short reflective essay, (2) taking the Harvard Implicit Association Test (IAT) and submitting a short reflective essay, (3) watching a DEI video and submitting a short reflective essay, and (4) visiting a DEI website, such as “Diversity in Chemistry” and write a short reflective essay on their favorite chemists.

1. DEI talks and events used for this program will be suggested by Arlene F. Nededog, Director of Inclusion in the College of Natural Sciences. D.I.V.E. will be a collaborative project between Ms. Nededog and Dr. Akiko Nakamura.
2. The IAT was selected because the test has been shown to be reliable, and its use is widespread in the implicit bias literature. The IAT examines unconscious feelings toward race, gender, sexuality, age and religion, and potential effects on participant self-image. Each student will choose which test to take based on their interest. <https://implicit.harvard.edu/implicit/>
3. DEI videos will be selected by Arlene F. Nededog.
4. The “Diversity in Chemistry” website (<https://sites.google.com/view/diversityinchemistry/>) is an online resource to introduce information on chemists from diverse backgrounds to the participating students. The positive effect of introducing diverse chemists in undergraduate chemistry courses has been published in Journal of Chemical Education (*J. Chem. Educ.* 2022, 99, 1, 504–507).  
<https://pubs-acrs-org.ezproxy2.library.colostate.edu/doi/10.1021/acs.jchemed.1c00394>  
Similar websites for other STEM fields will be searched and utilized for this project.

The principal investigator (PI), Akiko Nakamura, has successfully incorporated DEI activities into general and organic chemistry courses at her previous institution. The surveyed students’ feedback suggests that activities associated with DEI successfully promoted the importance of diversity and inclusion and have positive effects on their social awareness (*J. Chem. Educ.* 2022, 99, 1, 331–337).  
<https://pubs-acrs-org.ezproxy2.library.colostate.edu/doi/10.1021/acs.jchemed.1c00422>.

Also, the PI has integrated DEI activities into her CHEM113 and CHEM245 in Summer 2022 at Colorado State University. With the activities, students were exposed to the United Nation’s Sustainable Development Goals (<https://sdgs.un.org/goals>) and watched a video about social inequality in college students. The following comments were submitted in their reflective essays written after the activities:

*“My thoughts after watching the video makes me respect and appreciate the opportunities that I have been given because they will allow me to get to my goals faster... I believe that the way they created this example was thought-provoking and a good way to teach inequality.”*

*“Acknowledging this [inequality], as individuals and as a society we are able to create means of adjusting for these inequalities in hopes of creating a more fair, just, and meritocratic world.*

*“I was fortunate enough while growing up to not have to worry about many of the problems that the video demonstrated, but I strongly believe that everyone deserves the chance to have an equal future....Nobody should start their race behind anyone else, as this video demonstrated, and I believe that it is our duty as a society to even the playing field for everyone.”*

*“This video shows how far ahead opportunity can lead you. Life is not fair, and certain people are given head starts in life. This leads them to an easier race in their endeavors.... Tonight with this video in mind I will say my thanks for my school, my professors, the food in my pantry, my job and my support team.”*

*“There's nothing much to reflect on except for the fact that the video is completely true. Many people do not realize the opportunities they are given are sometimes seen as unfair.... I think the video was a really good way for younger kids to see what the real world looks like.”*

In summary, for CSU students to value and respect equity for all people and be part of an inclusive community, they should have an interdisciplinary program that integrates DEI. Therefore, the goal of the D.I.V.E. project is to develop curricular guidance that incorporates various DEI outside-classroom activities into STEM education to explore DEI issues (e.g. implicit bias, microaggressions, and stereotypes), which would improve the campus climate of inclusion and better prepare students to enter a diverse global workplace.

### **Timeline of Activities:**

A pilot program for the D.I.V.E. project will kick-off in January and run through Spring 2023 (Table 2). During the semester, Arlene Nededog and Akiko Nakamura will create options for DEI activities and plan program organization to provide “easy-to-adapt” methods for teaching faculty. Also, Arlene and Akiko will organize and facilitate trainings for faculty members who are interested in adapting D.I.V.E. into their courses. The pilot program will be evaluated by using students’ reflective essays and end-of-semester surveys. To help CSU STEM students dive into an engaged and respectful community by valuing DEI within their classrooms, input from the essays and surveys will be used to build a future DIVE program.

#### Spring 2023

- Introduce concept to student diversity programs and services to garner feedback - Arlene Nededog
- Identify DEI community programs in Northern Colorado – Arlene Nededog
- Attend, review, and identify DEI related events at Colorado State University and in northern Colorado – Arlene Nededog
- Run a pilot DEI program in chemistry courses: CHEM113 001, 002, and 003 sessions; 258 students in each (estimated a total of 774 students) - Akiko Nakamura
- Create the evaluation format for the program – Akiko Nakamura
- Collect resources for DEI activities in the STEM field – Arlene Nededog and Akiko Nakamura

Summer 2023

- Analyze outcomes from the pilot study in Spring 2023 and revise it for future programs in the College of Natural Sciences – Arlene Nededog and Akiko Nakamura
- Create a collection of DEI resources for the inclusive pedagogy for faculty members in the college – Arlene Nededog and Akiko Nakamura
- Develop workshops for faculty members for incorporating DEI activities – Akiko Nakamura
- Develop the curriculum additions – Arlene Nededog
  - Establish partnerships with the student diversity programs and services,
  - Develop the infrastructure for the implementation of TA collaboration and seek potential funding for program infrastructure.

Table 2: Project Timeline

	January	February	March	April	May	June	July	August
Project Kick-off	→							
Pilot Program								
Project Planning								
Create Resources								
Develop Training								
Assessment & Design of Project								
User Training								
Future DIVE Program								→

**Project Budget:**

Below describes the breakdown of our budget request (\$10,000).

\$5,000 - salary compensation for Akiko Nakamura, PhD.

- Akiko Nakamura (9-month contract) is an Assistant Professor of Chemistry and will serve as PI and Project Director on the proposed project.

\$3,000 - student stipends

- Graduate assistant(s) for grading reflective essays in Spring 2023
  - The PI will be the course instructor for CHEM113 Spring 2023, and the pilot study will be run in CHEM113 001, 002, and 003 sessions. The enrollment capacity for each class is 258 students (estimated a total of 774 students). The students will be asked to write a couple of short reflective essays (~ 300 words) after DEI activities, and the PI will need a TA for grading those essays.
- Work study student(s) for creating a collection of DEI resources
  - Resources will be developed for students' DEI activities and for teaching faculty members' professional development.

\$2,000 - developing DEI materials (web page design, books, videos, magazine subscriptions, etc.).

- Materials and Supplies
  - Funds will be used for purchasing DEI educational materials and developing DEI resources for CSU faculty, staff, and students.